



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/653,962

09/04/2003

Atsushi Nakamura

00862.023209

4026

5514

7590

04/25/2008

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

AYASH, MARWAN

ART UNIT

PAPER NUMBER

2185

MAIL DATE

DELIVERY MODE

04/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/653,962	Applicant(s) NAKAMURA, ATSUSHI	
	Examiner MARWAN AYASH	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action has been issued in response to the amendment filed 2/6/08. Claims 1-7, 12 are pending in this application. Applicant's arguments have been carefully considered, but are moot in view of new grounds of rejection. The examiner appreciates Applicant's effort to distinguish over the cited prior art by more distinctly claiming the invention, however, upon further search and/or consideration, the examiner believes the claims are not yet in condition for allowance. All claims pending in the instant application remain rejected and clarification and/or elaboration with respect to why the claims are not in condition for allowance will hereafter be provided in order to efficiently further prosecution.

Claim Objections

2. **Claims 1, 2, 6, 12 are objected to** because the recitations of "... processing to be performed for the plurality of data buffers" is substantially ambiguous at it leaves one of ordinary skill to guess as to how processing may be performed for a plurality of data buffers. This appears to be at least an issue of word choice. Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. It is noted that the system and apparatus of claims 1 and 6 respectively include data buffers which are understood to be hardware elements and thus ensure that the instant claims are directed to statutory subject matter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-7, 12 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Leong et al. (US Patent # 2003/0182503) in view of Asano et al. (US Patent # 6,820,187).

With respect to **independent claims 1, 2, 6, 12** Leong discloses: An information processing system/method/apparatus including

first and second devices which connect to each other via a communication control bus [*client 175, storage system 105, disk array 115 or any combination thereof including elements 145, 150, 155 (Leong – Fig. 1) – all elements are interconnected via bus/intercommunication means*];

wherein said first device comprises a plurality of buffers [*storage is comprised of a plurality of buffers, wherein a data buffer is understood to be some unit amount of storage operable to store data therein (Leong Fig. 1, paragraph 0004)*] and transmission unit/means for transmitting to said second device, a single command block [*a single (macro-command/request) I/O task is transmitted via transmission means (Leong Fig. 1) from a requestor to one or more targets in the form of a plurality of lower-level asynchronous I/O tasks (micro-commands) (Leong abstract, paragraphs 0014, 0046-0047, 0055)*] which designates processing to be performed for the plurality of data buffers [*a (macro-command/request) I/O task will designate some processing to be performed for the plurality of data buffers (storage areas) (Leong – abstract, paragraphs 0014, 0046-0047, 0055 and also Fig. 3, 5, paragraphs 0057-0070). Storage system 105 working in conjunction with any of the managers and/or software*

modules in memory 125 is operable to execute a command/request by interacting with a plurality of storage devices such as those in disk array 115 (Leong – abstract, Fig. 1, paragraph 0020)];

wherein said second device comprises completion notifying means for notifying said first device of completion of a data communication for one of the plurality of data buffers in said first device [as (micro) I/O tasks, (dealing with individual data buffers or storage areas) complete, the system issues messages/notifications of incremental progress to ensure efficient forward progress of larger tasks (Leong –abstract, paragraph 0050-0052, 0065-0066, 0069)];

wherein said first device further comprises update means for updating the one of the plurality of data buffers for which the data communication has been completed in accordance with the notification by said completion notifying means without updating the other data buffers among the plurality of data buffers [Leong's invention (including first and second devices) comprises update means to update storage areas for which there are no outstanding (completion notification not yet received) subordinate I/O tasks, and for not updating (via conditional task suspension) storage areas for which outstanding (completion notification not received) I/O task(s) exist or is/are in the process of completing (Leong – Fig. 4, 5)].

Leong does not **explicitly** disclose (hardware) devices comprising completion notifying (hardware) means for notifying each other of the completion of (data access) requests, but rather discloses his invention more so in the context of tasks notifying other tasks of the completion of data access requests. It is understood that the tasks are operating via the underlying hardware devices such that the limitation in question is understood to be at least implicitly taught or strongly suggested by the cited disclosure of Leong. Accordingly, it is noted that one of ordinary skill may understand Leong's disclosure to anticipate the instant claims.

Nevertheless, in the same field of endeavor Asano teaches a multiprocessor system wherein hardware devices (processors, and memory controllers) (*Asano Fig. 1, 6-7, 16*) operate in a cooperative multiprocessing environment in which commands/requests may be issued executed asynchronously (*Asano Col 5 lines 45-51*), and without waiting for a response to a previously sent command; wherein hardware means (counters and/or status

flags) are provided for notifying other hardware elements of command/request initiated completion of a data communication (*Asano – abstract, Fig. 1, Col 6 lines 12, Col 10 lines 20-30*).

Therefore Leong in view of Asano disclose all limitations of the instant claim(s) including:

wherein said first device further comprises update means for updating the one of the plurality of data buffers for which the data communication has been completed in accordance with the notification by said completion notifying means without updating the other data buffers among the plurality of data buffers [*counters/flags are only updated for those data transfer commands that have had notification so completion issued on their behalf (Asano – abstract, Fig. 1, Col 6 lines 12, Col 10 lines 20-30)*].

It would have been obvious to one having ordinary skill in the art at the time of the invention to allow hardware devices to notify each other as opposed to software constructs/mechanisms doing the same because this would be advantageous in terms of implementation flexibility (*Leong - 0035*) and moreover would have been within the purview of the artisan since it is known in the art that hardware and software are logically equivalent. Therefore it is understood that the tasks, and their underlying hardware perform the functionality of the claimed completion notifying means since although the instant claim limitation is directed toward hardware means for notifying a (hardware) device of completion of a data communication, the operations to be performed by the (hardware) means correspond to the operations performed by the tasks and/or underlying hardware supporting the tasks (as disclosed by Leong), and one of ordinary skill in the art would realize that a (software) task performing a set of operations would read upon a hardware element performing those same set of operations.

With respect to **dependent claim 3** as applied to claim 2 above Leong discloses the two devices are connected via a communication control bus complying with IEEE1394 [*The examiner is taking official notice that connecting to storage via IEEE 1394 would have been obvious to one having ordinary skill in the art at the time of the invention. Implementing this feature in the invention of Leong would have been obvious to one having ordinary skill in the art because connecting to external storage via IEEE 1394 is old and well known in the art (as evidenced by Palatov US PGPub # 2001/0029583 - page 8 paragraph 0098, page 14 paragraph 0164), and one of ordinary skill would be motivated to connect to external storage via IEEE1394 because an IEEE1394 interface is a known*

serial high speed interface for storage devices, and also because Leong suggests this limitation by disclosing coupling storage disks to a storage system over an I/O interconnect arrangement, such as a conventional high-performance, Fibre Channel serial link (Leong – paragraph 0037)].

With respect to **dependent claims 4, 7** as applied to claims 2, 6 above Leong discloses transmitting the command block [*Leong – paragraph 0046*] which contains a plurality of pieces of identification information respectively indicating the plurality of data buffers, and commands respectively for the plurality of data buffers [*an exemplary I/O task includes eight parameters, which include identification information respectively indicating the plurality of data buffers or storage areas, and commands respectively for the plurality of data storage areas (Leong – paragraph 0047 - 0049)*].

With respect to **dependent claim 5** as applied to claim 2 above Leong discloses writing data on the data buffer related to the command block or reading data from the data buffer related to the command block [*Leong – paragraph 0020*].

Response to Arguments

7. Applicant's arguments filed 2/6/08 have been fully considered but are not persuasive in view of the prior art and/or moot in view of new ground(s) of rejection. All claims pending in the instant application remain rejected. Please note that any rejections/objection not maintained from the previous Office Action have been rectified either by applicant's amendment and/or persuasive argument(s).

New/amended grounds of rejection have been applied to the amended claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. When responding to the office action, applicants are advised to clearly point out the patentable novelty which they think the claims present in view of the state of the art disclosed by the references cited or the objections made. Applicants must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c). In addition,

Art Unit: 2185

applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner in locating the appropriate paragraphs. **Any new claims and/or limitations should be accompanied by a reference as to where the new claims and/or limitations are supported in the original disclosure.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marwan Ayash whose telephone number is 571-270-1179. The examiner can normally be reached on Mon-Fri 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571)272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marwan Ayash -- Examiner -- Art Unit 2185

4/14/08

/Sanjiv Shah/

Supervisory Patent Examiner, Art Unit 2185